MicroVAX Diagnostic Monitor Ethernet Server User's Guide

Order Number AA–FNTAE–DN

This manual describes how to install the MicroVAX Diagnostic Monitor Ethernet Server Kit on a host VMS operating system and how to use the DECnet/Ethernet network facilities to down-line load MicroVAX Diagnostic Monitor software to a target system.

This manual supersedes the *MicroVAX Diagnostic Monitor Ethernet Server User's Guide*, AA–FNTAD–DN.

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Preface

Intended Audience

This manual is written for those who install and use the MicroVAX Diagnostic Monitor Ethernet Server Kit. To install the kit in the DECnet/Ethernet environment, the installer must have the SYSPRV privilege of a system manager's account. A system manager should normally install the kit.

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Document Structure

This manual contains six chapters, an appendix, and a glossary as follows:

- Chapter 1 gives an overview of the operating environment and the installation procedure.
- Chapter 2 explains how to install the MicroVAX Diagnostic Monitor Ethernet Server Kit on a host VAX or MicroVAX that runs VMS software.
- Chapter 3 explains how to prepare a host VAX or MicroVAX and target system to use the MicroVAX Diagnostic Ethernet Server Kit.
- Chapter 4 explains how to set up the DECnet database to allow the down-line loading of MDM software from the host system to a target.
- Chapter 5 explains how to down-line load MDM software from the host system to a target.
- Chapter 6 explains how to boot MDM from the target.
- Appendix A explains how to use the remote console feature of MDM.
- Appendix B explains how to install the Ethernet Ultrix Kit on a system that uses the Ultrix operating system.
- The Glossary provides definitions for terms used in the manual. The terms are related to software installation and network management.

Conventions

This book uses the following conventions to indicate how to enter commands from the keyboard:

KEY	Indicates a key on the keyboard. For example, RETURN is a key.
Press	Indicates making one keystroke with the specified key.
Type	Indicates entering characters from the keyboard. For example, to type EXIT, enter four keystrokes: one for each letter.
CTRL/key	Indicates control keys. For example, Control C is shown as CTRL/C. Enter CTRL/C by holding down CTRL and pressing C.
Bold print after prompt	Indicates user input.
UPPERCASE characters	Indicate input to be typed exactly as shown.
lowercase characters	Indicate input to be replaced with an appropriate word or phrase. For example, in the following interactive command, type SELECT as shown, but replace device_name with the actual name of a device: MDM>> **SELECT device_name**

Associated Documents

The following is a list of documents dealing with the installation and use of the MicroVAX Diagnostic Monitor:

- *DECnet-VAX System Manager's Guide*
- *Guide to VAX/VMS Software Installation*
- *MicroVAX Customer Hardware Information*
- *MicroVAX Diagnostic Monitor Development Kit Installation Guide*
- *MicroVAX Diagnostic Monitor Hard Disk User's Guide*
- *MicroVAX Diagnostic Monitor Programmer's Guide*
- *MicroVAX Diagnostic Monitor Reference Card*
- *MicroVAX Diagnostic Monitor Release Notes*
- *MicroVAX Diagnostic Monitor User's Guide*
- *MicroVAX Maintenance Guide*
- *VAX/VMS Authorize Utility Reference Manual*

Chapter 1
Overview of the Kit

This chapter describes the MicroVAX Diagnostic Monitor Ethernet Server Kit (MDMESK) and explains how the kit works in the DECnet/Ethernet network environment. The chapter also summarizes the kit's software installation procedure. The worksheet in Chapter 3 conveniently organizes the information needed to use the kit; the manual refers to the worksheet often.

1.1 DECnet/Ethernet Operating Environment

The MicroVAX Diagnostic Monitor (MDM) runs on the MicroVAX family of computer systems to verify that the systems operate correctly. If a MicroVAX malfunctions, MDM diagnostic programs test the computer's devices and identify the problem.

The MDM Ethernet Server Kit transfers MDM's diagnostic capability from a host system to a target MicroVAX by down-line loading MDM software over DECnet/Ethernet communication lines. Once MDM is in the target system's volatile memory, the diagnostic tests run from the target's console terminal. Figure 1–1 shows how the kit works in the DECnet/Ethernet operating environment.

NOTE: *The MDM Ethernet Server Kit allows testing of a system that has no load device.*

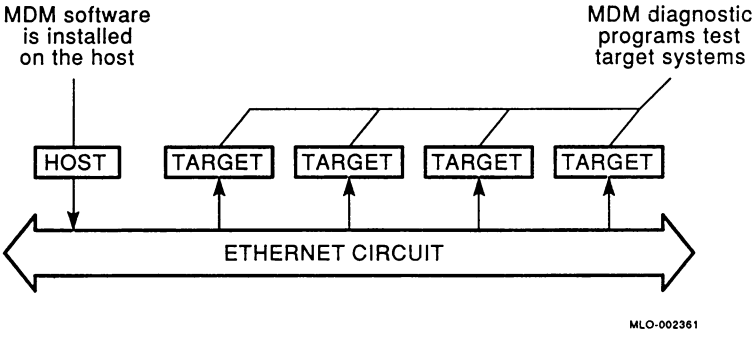
1.2 Overview of the Installation Procedure

To install the kit, the installer must have the SYSPRV privilege of a system manager's account. The following list outlines the steps needed to install and use the MDM Ethernet Server Kit:

1. Install the MDM Ethernet Server Kit software on a VMS host system.
2. Modify the host's DECnet database to allow down-line loading of the MDM software over the Ethernet communication lines to the target system.
3. Boot MDM diagnostic software at the target system's console terminal to diagnose the target system.

The following sections describe each step.

Figure 1–1: Operating Environment



1.2.1 Installing the Kit on the Host

Use the VMS installation procedure, VMSINSTAL, to install the kit on the host. To run VMSINSTAL, log into an account that has either SETPRV or SYSPRV privileges. These privileges are typical of a system manager's account. Section 2.5 describes the procedure for running VMSINSTAL.

1.2.2 Modifying the Host's DECnet Database

Before the host system can down-line load software to the target system, store information about the network connection between the host and target systems in the host's DECnet volatile database. The user must be in an account with OPER privileges. The database stores the following information:

- The host's DECnet service circuit
- The host's readiness to down-line load software
- The target's node name
- The target's Ethernet hardware address

Section 4.3 describes the procedure for modifying information in the database.

1.2.3 Booting MDM at the Target

Booting MDM at the target starts the down-line loading of the software from the host to the target. Special account privileges are not required to boot and use MDM on the target system. Chapter 6 describes the procedure for booting MDM.

1.3 Outline of Installation Procedure

The following list outlines the procedures for installing and using the MDM Ethernet Server Kit:

1. Pre-Installation
   a. Prepare the host system for new installation.
      - Check for a prior installation.
      - Check the kit's software version.
      - Reinstall the kit.
   b. Fullfill system requirements.
      - Satisfy software requirements.
      - Satisfy system requirements.
      - Verify account privileges and quotas.
   c. Establish system protection.
      - Purge and back up the target disk.
      - Stop interactive and batch processes.
      - Stop network activity.
      - Modify the user authorization file.
2. Installation
   a. Run the VMS installation procedure (VMSINSTAL).
   b. Exit VMSINSTAL.
   c. Verify the installation.
   d. Make the installation permanent on the host system.
   e. Deinstall the kit.

3. Down-line Load
   a. Prepare to down-line load.
      - Determine the load file name.
      - Modify the host database for down-line loading.
   b. Follow the down-line loading sequence.
      - Establish login proxy.
      - Stop multiple hosts from down-line loading software into target.
      - Restore the down-line loading connection.
4. Booting MDM at the target
   a. Boot MDM at the target with halt enabled.
   b. Boot MDM at the target with halt disabled.

Chapter 2
Installing the Kit

This chapter describes how to check that all system and software prerequisites for installation are met and explains how to use the VMSINSTAL command procedure to install the MDM Ethernet Server Kit on a VMS host system. The installation requires 20 minutes.

2.1 Checking for a Prior Kit Installation

To determine whether the kit was installed previously, log into a host system account. Type the following command to check that a directory contains MDM diagnostic programs:

```
$ SHOW LOGICAL MDM$MAINT
```

If the kit has been installed, the following VMS logical name assignment appears:

```
"MDM$MAINT" = "ddun:[MDMMAINT]" (LNM$SYSTEM_TABLE)
```

2.1.1 Checking the Kit's Software Version

If the logical name assignments resulting from a prior kit installation are present in the host directory, check that the software is the current version. The software version is shown in the kit's load file names. For information about viewing load file names, see Section 4.2.

2.1.2 Reinstalling the Kit

Install the current revision of the kit on the host by performing the installation procedure described in Section 2.5. Files from earlier installations are purged automatically.

2.2 Installation Requirements

Before installing the MDM Ethernet Server Kit, check that the following requirements are met:

- Software requirements
- System requirements
- Account privileges and quota requirements

The following sections describe procedures for checking each requirement.

2.2.1 Software Requirements

The MDM Ethernet Server Kit must be installed on a VAX or MicroVAX system running VMS, Version 4.4 or later.

The down-line loading of MDM to target MicroVAXes requires that DECnet-VAX be installed on the host system.

2.2.2 System Requirements

The MDM installation procedure requires at least 11,000 free blocks on the host system target disk (the disk where MDM will reside). To display the number of available free blocks, complete the following steps:

1. Log into the system manager's account as follows:

   ```
   USERNAME:SYSTEM
   PASSWORD:password
   ```

2. Show information about the target disk by typing the following command:

   ```
   $ SHOW DEVICE target_disk_name:
   ```

   For example, if the target disk is DUB1, the command is:

   ```
   $ SHOW DEVICE DUB1:
   ```

   The number of free blocks is shown under the heading Free blocks in a display similar to the following:

   ```
   Device     Device      Error   Volume    Free     Trans  Mnt
    Name      Status      Count   Label     Blocks   Count  Cnt
    DUB1:     Mounted       0     USER5     24531      5     3
   ```

   Some of this space is used temporarily during the installation process. MDM occupies approximately 7000 blocks.

The Device Status must read "mounted" or "online"; any other reading indicates a problem with the drive. If the status reads "mounted," no further action is necessary to meet system requirements; if the status reads "online," enter the following command to mount the drive:

```
$ MOUNT/SYSTEM target_disk_name:
```

2.2.3 Account Privileges and Quotas

MDM installation must be done from an account with the SYSPRV privilege. This privilege is typical of the system manager's account. To show account privileges, type the following command:

```
$ SHOW PROCESS/PRIVILEGE
```

Account privileges are shown under the heading Process privileges in a display similar to the following:

```
Process privileges:
 SETPRV               may set any privilege bit
 TMPMBX               may create temporary mailbox
 NETMBX               may create network device
 SYSPRV               may access objects via system protection
```

2.3 Preliminary Steps

The following list outlines preliminary steps to installation:

1. Purge and back up the target disk.
2. Stop interactive and batch processes.
3. Stop network activity.
4. Modify the user authorization file.

To ensure correct installation, the site system manager performs the actions described in the following sections.

2.3.1 Purging and Backing Up the Target Disk

After logging into the privileged account, remove all unwanted or redundant files from the host target disk; then mount and back up the target disk using the following commands:

```
$ MOUNT/FOREIGN backup_media:
$ BACKUP/IMAGE target_disk_name: backup_media:
```

For example, to back up to magnetic tape MTA0: when the target disk is DQA0:, issue the following command:

```
$ BACKUP/IMAGE DQA0: MTA0:
```

Backing up the target may take 1 hour.

2.3.2 Stopping Interactive and Batch Processes

Ensure that all users are logged out and that all batch jobs are complete. Although users with OPER privileges can login, prevent all other users from gaining access to the system. Type the following command:

```
$ SET LOGINS/INTERACTIVE=0
```

To reset the interactive logins to previous setting, enter the following command:

```
$ SET LOGINS/INTERACTIVE=number_of_logins
```

2.3.3 Stopping Network Activity

To ensure that DECnet is inoperative, type the following commands:

```
$ RUN SYS$SYSTEM:NCP
NCP>  SET EXECUTOR STATE OFF
NCP>  EXIT
$
```

After the installation is complete, enter the following commands to turn the network on again:

```
$ RUN SYS$SYSTEM:NCP
NCP>  SET EXECUTOR STATE ON
NCP>  EXIT
$
```

CAUTION: *Complete or stop network-dependent operations before making DECnet inoperable. Mail and file transfers are affected by shutting down the network.*

2.3.4 Modifying the User Authorization File

Ensure that the limits in the user authorization file (UAF) are equal to or greater than the required values specified here:

```
Paging file size (Pgflquota:) = 4000
Working set size (WSquo:) = 250
Open file quota (Fillm:) = 20
AST limit (ASTlm:) = 20
```

After logging into the SYSTEM account, use the UAF utility to check the limits by typing the following commands:

```
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
UAF> SHOW SYSTEM
```

If necessary, use the MODIFY command to modify these values:

```
UAF> MODIFY SYSTEM/limit=new value
```

For example, to increase the WSQUOTA limit to 300, type the following command:

```
UAF> MODIFY SYSTEM/WSQUOTA=300
```

To exit the UAF utility, type:

```
UAF> EXIT
$
```

Log out and then log in again to have the modifications take effect; otherwise, the installation may fail. For more information about the UAF utility, refer to the *VAX/VMS Utilities Reference Volume*.

2.4 Stopping the Installation Procedure

Pressing CTRL/Y stops the installation procedure. Check the SYS$UPDATE directory for MDMESK.DIR; to save disk space, delete MDMESK.DIR and its contents.

2.5 Installation Procedure

The installation procedure requires 20 minutes. When using the MDM Ethernet Server Kit at a noncontract site, delete the software from the host after using MDM to test the target system. For information about deinstalling the kit, see Section 2.7.

To install the kit, perform the following steps:

1. Log into the system manager's account:

   ```
   USERNAME:SYSTEM
   PASSWORD:password
   ```

2. Type the following command to run the VMS installation procedure, VMSINSTAL:

   ```
   $ @SYS$UPDATE:VMSINSTAL
   ```

The procedure responds with the following messages:

```
VAX/VMS Software Product Installation Procedure V4.4

It is dd-mmm-yyyy at hh:mm.
Enter a question mark (?) at any time for help.
```

3. Type a Y for yes after the following question:

```
Are you satisfied with the backup of your system disk [YES]?
```

4. Type the name of the device that the software distribution volume is mounted on. For example, if the distribution device is magnetic tape MUA0:, the dialogue is:

```
Where will the distribution volumes be mounted: MUA0:
```

If the distribution device is an RL02:, type the following response:

```
Where will the distribution volumes be mounted:ddlan:[MDMMAINT]
```

NOTE: *A device name has the form ddun:, where ddu is the device code and n is the unit number.*

5. Enter the name of the kit at the prompt for products as follows:

```
* Products:MDMESK
```

NOTE: *The kit name varies with future revisions and releases. Check the current release notes for changes in the kit name or in the installation procedure.*

6. Physically mount the distribution volume containing the kit. Then type YES at the system prompt as follows:

```
Please mount the first volume of the set on MUA0:
* Are you Ready? YES
```

The following messages result:

```
MOUNT-I-MOUNTED, MDMESK mounted on MUA0:
The following products will be processed:

MDMESK V0.A
Beginning installation of MDMESK V0.A at hh:mm
%VMSINSTAL-I-RESTORE, Restoring product saveset A...
```

7. Enter the name of the target disk that holds the MDM kit directory. VMSINSTAL specifies the default as the system disk. For example, if the system disk is DUA0: and you want to install the MDM service kit on target disk DUA1:, the dialogue is:

```
* Specify Device for MDM kit directory [DUA0:] DUA1:
```

The following messages display:

```
VMSINSTAL-I-SYSDISK, this product creates system disk
directory DUB1:[MDMMAINT].
```

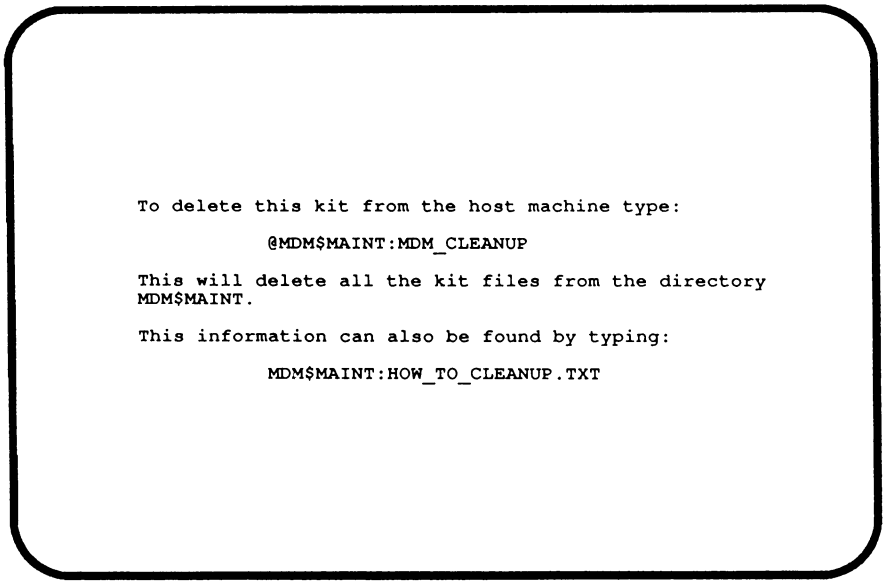
NOTE: *Type a different device name after the device request to specify a system device that is different from the one shown in brackets.*

8. Check that the following VMSINSTAL progress messages appear as the installation procedure runs to completion. This part of the installation procedure takes 15 minutes.

In addition, MDM software displays a boxed message that tells how to delete the MDMESK kit from the host system. After installation, a confirmation message appears followed by the display shown in Figure 2–1.

```
%VMSINSTAL_I_MOVEFILES, Files will now be moved to their target
directories
```

Figure 2–1: MDMESK Display


To delete this kit from the host machine type:
@MDM$MAINT:MDM_CLEANUP
This will delete all the kit files from the directory MDM$MAINT.
This information can also be found by typing:
MDM$MAINT:HOW_TO_CLEANUP.TXT

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After this screen is displayed, the following message appears:

```
Installation of MDMESK V2.1 completed at hh:mm
```

Press CTRL/Y to stop the installation procedure. Check the SYS$UPDATE directory for MDMESK.DIR; to save disk space, delete MDMESK.DIR and its contents.

9. Exit the installation procedure by typing EXIT in response to the following prompt:

```
Enter the products to be processed from the next distribution
volume set.
* Products: EXIT
```

VMSINSTAL displays this final message:

```
* VMSINSTAL procedure done at hh:mm
$
```

10. Verify that the installation was successful. Check that the following VMS logical names and a directory containing MDM diagnostic programs exist by typing:

```
$ SHOW LOGICAL MDM$MAINT
```

The following logical name assignment appears:

```
"MDM$MAINT" = "ddun:[MDMMAINT]" (LNM$SYSTEM_TABLE)
```

NOTE: *In the host system responses shown here, ddun: is the name of the system disk specified in step 7.*

Show the additional logical assignments by typing the following command:

```
$ SHOW LOGICAL MOM$LOAD
```

On a CI, NI, or DSSI VAXcluster host, the following logical assignments appear:

```
"MOM$LOAD" = "SYS$SYSCOMMON:[SYSEXE]" (LNM$SYSTEM_TABLE)
= "MDM$MAINT"
1 "MDM$MAINT" = "ddun:[MDMMAINT]" (LNM$SYSTEM_TABLE)
```

If the host is *not* on a CI, NI, or DSSI VAXcluster, the following logical assignments appear:

```
"MOM$LOAD" = "SYS$SYSROOT:[SYSEXE]" (LNM$SYSTEM_TABLE)
= "MDM$MAINT"
1 "MDM$MAINT" = "ddun:[MDMMAINT]" (LNM$SYSTEM_TABLE)
```

11. Determine the load file name for the target system following the instructions given in Section 4.2.

2.6 Making the Installation Permanent on the Host System

Only licensed users who purchase the MDM Ethernet Server Kit may install the kit permanently on the host system. To install the Ethernet Server Kit permanently on the host system, edit the SYSTARTUP.COM file located in the system manager's account and make the following logical assignments:

- If the host system is on a CI, NI, or DSSI VAXcluster, type:

```
$ DEFINE/SYSTEM ddun:[MDMMAINT] MDM$MAINT
$ DEFINE/SYSTEM/EXEC MOM$LOADSYS$SYSCOMMON:[SYSEXE],MDM$MAINT
```

In the commands shown here, ddun: is the name of host system disk.

- If the host system is *not* on a CI, NI, or DSSI VAXcluster, type:

```
$ DEFINE/SYSTEM ddun:[MDMMAINT] MDM$MAINT
$ DEFINE/SYSTEM/EXEC MOM$LOADSYS$SYSROOT:[SYSEXE],MDM$MAINT
```

  The MOM$LOAD logical may be defined to more directories than sys$syscommon:[sysexe] or sys$sysroot:[sysexe]; include these additional directories in the definition.

2.7 Deinstalling the Kit

After running the kit, delete it from a noncontract site. Run the deinstallation procedure, but only after testing the target system with the MDM software.

To run the deinstallation procedure, type the following command at the host system:

```
$ @MDM$MAINT:MDM_CLEANUP
```

The system displays the following progress messages as the MDM diagnostic files and the diagnostic directory are deleted:

```
You have started the procedure to delete the
files in the MDM$MAINT account where MDMESK
(the MDM Ethernet Server Kit) is installed.

    This may take a few minutes.

The entire directory contents of MDM$MAINT
have been deleted:
```

Chapter 3
Preparing to Use the Kit

This chapter explains how to prepare to use the MDM Ethernet Server Kit. Gather all information necessary to complete the worksheet in Section 3.1.

3.1 Worksheet

Before installing the MDM Ethernet Server Kit, use the worksheet at the end of this section to record the information necessary for using the kit. Use a separate worksheet for each target system to be tested.

Fill in the first five items in the worksheet. The items are as follows:

1. Host node name
2. Host node location
3. Target node name
4. Target node location
5. Host account with operator privileges (OPER)

Ask the site system manager to provide the information needed to fill in the next items:

6. Does the target have enough memory to run MDM?
7. Do host and target share the same Ethernet circuit?
8. What is the host service circuit?
9. What is the target hardware address?
10. What is the load file name?

The following sections explain how to determine each item on the worksheet.

Figure 3–1: Worksheet

Directions: Fill in the information listed in the worksheet before installing and using the software.

ITEM:	EXAMPLE:	FILL IN:
1. Host Node Name	MNO	
2. Host Node Location	Computer lab	
3. Target Node Name	CEB	
4. Target Node Location	Office at pole D7	
5. Host Account Name with Operator Privileges	JOHNSON	
6. Does the Target Have Enough Memory?	YES	
7. Do Host and Target Share Same Ethernet Circuit?	YES	
8. Host Service Circuit	UNA-0	
9. Target Hardware Address	AA-00-03-01-3C-79	
10. Load File Name	NA06AC.SYS	

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3.2 Completing the Worksheet

Obtain information from the system manager to complete the worksheet. For information not available from the system manager, follow procedures in Sections 3.2.1 through 3.2.5.

3.2.1 Determining the Target Memory Size

The amount of memory needed to run MDM from a target depends on the system configuration: more devices require more memory. Test the devices in combinations that fit the target's memory. The following methods explain how to determine the memory size for targets that run VMS and targets that do not run VMS:

1. Enter the following command to determine the amount of memory available to a target that is running VMS:

   ```
   $ SHOW MEMORY/PHYSICAL_PAGES
   ```

   The command returns the following information:

```
System Memory Resources on 30-JAN-1989 10:05:33.72
Physical Memory Usage (pages): Total   Free    In Use  Modified
Main Memory (16.00Mb)          32768   14609   17642   517
```

   The Main Memory heading shows the amount of physical memory in the system.

   NOTE: *If the target is running any operating system, shut it down before running in console mode.*

2. For targets not running VMS, complete the following procedure to check that the target has 2 Mbytes of memory:

   a. Place the target system in console I/O mode by pushing the Halt Enable switch to the Halt Enabled position. Figure 3–2 shows the CPU panel and the Halt Enable switch set to the Halts Enabled position.

      If the target's power 1/0 switch is in the 1 position, press BREAK on the console terminal. The console terminal displays the **>>>** prompt to indicate that the system is in console I/O mode.

      If the system's power 1/0 switch is in the 0 position, set the power switch to 1. The terminal displays the numbers 7 through 3 to indicate completion of steps in the power-on test. After completion of the power-on test, the console terminal displays the >>> prompt.

b. Type the following command to access a memory location greater than 2 Mbytes:

```
>>> E/P/W 200002
```

Then press RETURN. If the target contains only 2 Mbytes of memory, the attempt to access a greater memory location fails and the following error message appears:

```
?1A ILL ADR
```

If the target contains more than 2 Mbytes of memory, the attempt to access a greater memory location succeeds. A typical display follows:

```
P 00200002 AAAA
```

3.2.2 Determining the Ethernet Circuit

The Ethernet circuit is the cable that connects all nodes on a DECnet/Ethernet network. The host and target nodes must share the same Ethernet circuit in order to exchange network commands needed during down-line loading and booting. Often, the site system manager knows whether the same circuit connects the host and target systems; ask the manager about the connection. Otherwise, use either of the following methods to verify the Ethernet circuit connection.

3.2.2.1 Method 1—Tracing the Ethernet Cable

Perform the following steps:

1. Before determining whether the host and target are on the same Ethernet cable, check that they are in the same network area by comparing their numerical node addresses. A host and target that are not in the same network area are not connected by the same Ethernet circuit.

   Nodes in the same network area have identical numbers preceding the decimals in their node addresses. For example, if the host node address is 7.435 and the target address is 7.183, the identical 7s preceding the decimals mean that the host and target nodes are in the same network area.

   To display the network areas, complete the following steps:

   a. Type the following command at a host terminal to enter the DECnet Network Control Program (NCP):

      ```
      $ RUN SYS$SYSTEM:NCP
      ```

The NCP utility is the principal tool used to control the network software and hardware. The utility is described fully in the *DECnet-VAX System Manager's Guide.*

b. Type the following NCP command to view the host node address:

```
NCP> SHOW NODE host_name
```

The host node address appears after Executor node in a Node Volatile Summary display similar to the following one:

```
Node Volatile Summary as of  8-JUL-1989 09:48:43

Executor node = 5.172 (JOHN)

State                     = on
Identification            = DECnet-VAX V4.5, VMS V4.5
```

In the above display the host DECnet node address is 5.172.

c. Display the address for the target node by typing the SHOW NODE command, but replace the host node name with the target node name as follows:

```
NCP> SHOW NODE target_name
```

The target node address appears under the Node heading in a Node Volatile Summary display similar to the following one:

```
Node Volatile Summary as of 20-MAR-1989 10:27:11

Node    State       Active  Delay   Circuit     Next node
                            Links

 5.524 (CEB)                        QNA-0        5.170
```

Note that both the host and target node addresses have 5s preceding the decimals. The identical numbers confirm that the host and target are in the same network area and might be on the same Ethernet circuit.

If the target has not been stored in the host's DECnet database, issuing the SHOW NODE command results in a display similar to the following:

```
Node Volatile Summary as of 20-MAR-1989 13:22:29

%NCP-I-NMLRSP, listener response - Unrecognized component,
Node
```

See the *DECnet-VAX System Manager's Guide* for instructions on how to add the target to the host DECnet database.

2. Trace the Ethernet cable from its connection on the DEQNA panel on the backplane of the MicroVAX to its connection with the host. If the host and target are connected by the same Ethernet cable, they are on the same Ethernet circuit.

3.2.2.2 Method 2—Checking Whether the Host Receives Boot Requests

Perform the following steps:

1. Use Method 1 in Section 3.2.2.1 to check that the host and target are in the same network area.
2. Enable DECnet event logging to determine whether the host receives boot requests from the target. If the host receives the target's boot request, the same Ethernet circuit connects the host and target. Use the following procedure to ensure that the target's boot requests reach the host:

   a. Type the following commands to enable DECnet event logging at the host console:

   ```
   $ RUN SYS$SYSTEM:NCP
   NCP> SET LOGGING CONSOLE KNOWN EVENTS
   NCP> SET LOGGING CONSOLE STATE ON
   NCP> EXIT
   $ REPLY/ENABLE=NETWORK
   ```

   b. Boot the target as follows:

   Push the Halt Enable switch on the MicroVAX CPU panel at the rear of the system to the Halts Enabled (dot inside circle) position. Figure 3–2 shows the CPU panel and the Halt Enable switch set to the Halts Enabled position. If the target's power 1/0 switch (marked with 1/0 symbol) is in the 1 position and the system is running, press BREAK on the console terminal to display the console I/O mode prompt (>>>).

   c. Type the following commands on the target to send boot requests to the host:

   ```
   >>> B XQA0
   ```

   If the system's power 1/0 switch is in the 0 (OFF) position, set the power switch to the 1 position. The console terminal should display the numbers 7 through 3, indicating the completion of steps in the power-on tests. After the power-on tests are completed, the terminal should display the console I/O (>>>) prompt. Cause the target to send boot requests by typing the B command as shown above.

d. Return to the host console terminal to view DECnet event-logging information. If the same Ethernet circuit connects the host and target, the target's boot request causes a display similar to the following to appear:

```
%%%%%%%%%% OPCOM 30-JAN-1989 13:07:18.25 %%%%%%%%%%
Message from user DECNET
DECnet event 0.7, aborted service request
From node 5.172 (JOHN), 30-JAN-1989 13:07:18.20
Circuit UNA-0, Line open error, Unrecognized component
Ethernet address = AA-00-03-01-3F-0E
$
```

DECnet event logging displays a series of event 0.7 messages for each target booted on an Ethernet circuit. If multiple targets are booted on the same circuit, compare their Ethernet addresses to differentiate one target's 0.7 message from another's. Each target displays a unique Ethernet address in the last line of the 0.7 message. Confirm that a message came from the target by repeating the boot procedure until the 0.7 messages display only one Ethernet address.

e. Type the following commands to disable event logging:

```
$ REPLY/DISABLE
$ RUN SYS$SYSTEM:NCP
NCP> SET LOGGING CONSOLE STATE OFF
NCP> EXIT
$
```

3.2.3 Determining the Service Circuit

The service circuit is the connection between the host and the target through which software is down-line loaded. The following table provides the service circuit for several hosts:

Table 3–1: Service Circuit Connections

Connections	Service Circuit
UNIBUS	UNA_0 or UNA_1
Q-BUS[1]	QNA_0 or QNA_1
BI	BNT_0 or BNT_1
KA640 CPU	SVA_0

[1]MicroVAX contains a Q-bus.

To verify the host service circuit, use the SHOW CIRCUIT command. For example, if the host contains a UNIBUS, type:

```
$ RUN SYS$SYSTEM:NCP
NCP> SHOW CIRCUIT UNA-0
NCP> SHOW KNOWN CIRCUIT
```

If the host has service circuit UNA–0, UNA–0 appears under the Circuit heading in a Circuit Volatile Summary display similar to the following:

```
Circuit Volatile Summary as of  2-MAR-1989 15:43:35

  Circuit           State       Loopback      Adjacent
                                 Name          Node
  UNA-0              on                     5.511 (PUTZI)
```

If the host does not contain the service circuit, the Circuit Volatile Summary displays the following message:

```
Circuit Volatile Summary as of  2-MAR-1989 15:44:32

No information in database
```

If the host contains two service circuits—for example, QNA–0 and QNA–1— choose the circuit listed in the NCP SHOW NODE target_name display. See step 1.c, Method 1 in Section 3.2.2.1. If the information is not available, enable DECnet event logging to view the service circuit. Follow the procedure outlined in Section 3.2.2.2, step 2. In the message that results in step 2.d, the host service circuit is listed after the Circuit heading.

3.2.4 Determining the Target's Ethernet Hardware Address

The hardware address is the Ethernet address contained in read-only memory (ROM) on the target DEQNA, DELQA, DESQA, or KA640 Ethernet interface module. This unique address is required for down-line loading software from the host to the target over the Ethernet. Use one of the following methods to obtain the hardware address.

3.2.4.1 Method 1—Using NCP at the Host Terminal

If the target is running DECnet, the fastest and easiest method to obtain the target hardware address is to use the following NCP command at a host terminal. Use the target node name and service circuit information listed on the worksheet.

```
$ RUN SYS$SYSTEM:NCP
NCP> TELL target_name SHOW CHARACTERISTICS LINE QNA-0
NCP> TELL target_name SHOW CHARACTERISTICS LINE SVA-0
```

The host console terminal displays the target hardware address in the last line of a display similar to the following:

```
Node Volatile Characteristics as of 5-MAR-1989  14:19:02

Line = QNA-0
Hardware address          = AA-00-03-01-3C-79
```

In this example, the Ethernet hardware address is AA–00–03–01–3C–79.

3.2.4.2 Method 2—Using the Target Console Program

To determine the target hardware address, examine the contents of the DEQNA's device registers at the target console terminal as follows:

1. Place the target in console I/O mode by pushing the Halt Enable switch on the CPU panel at the rear of the system to the Halts Enabled (dot inside circle) position. Figure 3–2 shows the CPU panel and the Halt Enable switch set to the Halts Enabled position. If the target's power 1/0 switch is in the 1 position, press BREAK on the console terminal. The console terminal should display the **>>>** prompt, indicating that the system is in console I/O mode.

   If the system's power 1/0 switch is in the 0 position, set the power switch to 1. The terminal displays the numbers 7 through 3, indicating the completion of steps in the power-on test. After the power-on test is completed, the console terminal should display the >>> prompt.

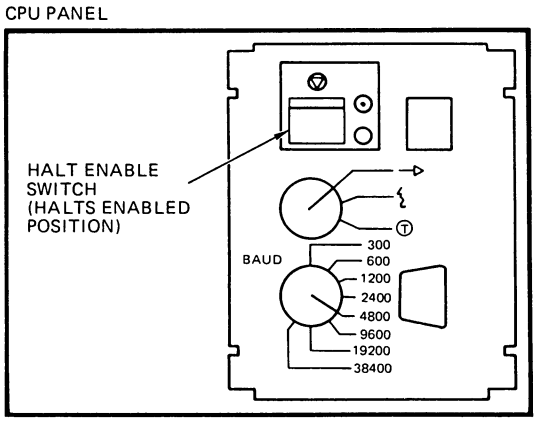
2. Type the following command to get the contents of the six DEQNA's device register:

   ```
   >>> E/P/W/N:5 20001920
   P 20001920 FFAA
   P 20001922 FF00
   P 20001924 FF03
   P 20001926 FF01
   P 20001928 FF12
   P 2000192A FF49
   >>>
   ```

   The last two characters in the output string, AA, are the first two characters of the DEQNA's hardware address. To obtain the five additional sets of characters in the DEQNA's hardware address, place together the last two characters of each string.

3. Join the last two characters of each output string in the order given, separating each pair of characters by hyphens. For example, the

Figure 3–2: CPU Panel and Halt Enable Switch



DEQNA's Ethernet hardware address from the output shown above is AA–00–03–01–12–49.

If the target system is a MicroVAX 3000 series, type:

```
>>>  SHOW ETHERNET
```

3.2.4.3 Method 3—Using DECnet Event Logging

The most difficult way to obtain the hardware address is by enabling DECnet event logging from the host terminal and booting the target.

1. Type the following command to enable DECnet event logging on the host console:

```
$ RUN SYS$SYSTEM:NCP
NCP> SET LOGGING CONSOLE KNOWN EVENTS
NCP> SET LOGGING CONSOLE STATE ON
NCP> EXIT
$ REPLY/ENABLE=NETWORK
```

2. Follow the procedure described in the preceding Method 2, step 1, Section 3.2.4.2 to put the target in console I/O mode.

3. Type the BOOT command or enter B at the console terminal to start boot requests from the target to the host:

```
>>> B XQA0
```

4. Return to the host console terminal to view event-logging information. Booting the target displays a message on the host console terminal similar to the following:

```
%%%%%%%%%% OPCOM 30-JAN-1989 13:07:18.25 %%%%%%%%%%
Message from user DECNET
DECnet event 0.7, aborted service request
From node 5.172 (JOHN), 30-JAN-1989 13:07:18.20
Circuit UNA-0, Line open error, Unrecognized component, Node
Ethernet address = AA-00-03-01-3F-0E
```

   The last line of the event-logging information displays the target Ethernet hardware address. In this example, the address is AA–00–03–01–3F–0E.

   DECnet event logging displays a message for each system booted on the Ethernet circuit. If there are 0.7 event messages with different Ethernet hardware addresses, determine which message came from the target by repeating the boot procedure until only one Ethernet address is displayed.

5. Type the following commands to disable event logging:

```
$ REPLY/DISABLE
$ RUN SYS$SYSTEM:NCP
NCP> SET LOGGING CONSOLE STATE OFF
NCP> EXIT
$
```

3.2.5 Completing Preliminary Steps to Installation

The previous sections explained how to obtain information about the target and Ethernet circuit needed to down-line load the MDM Ethernet Server Kit to the target system.

Continue to Chapters 4 and 5 for explanations on down-line loading MDM software.

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Chapter 4
Preparing the Host to Down-Line Load Software

This chapter explains how to set up the DECnet database in order to down-line load the MDM Ethernet Server Kit to the target. Work with the DECnet database requires access to an account with operator privileges (OPER).

4.1 The VAXcluster Host Environment

If the MDM Ethernet Server Kit is installed on a local area VAXcluster host system, the DECnet database is already prepared for down-line loading; proceed directly to Chapter 5 of the *MDM Ethernet Server Kit*.

4.2 Determining the Load File Name

Use the load file name to boot and down-line load MDM software from the host to the target system. To determine the correct load file for both the customer and service versions of MDM, complete the following steps:

1. Display the kit directory by typing the following command:

   ```
   $ DIR  MDM$MAINT:*.SYS
   ```

   A directory of load file names similar to the following appears for the customer kits:

   ```
   Directory DJBO:[MDMMAINT]

   NA08Ae.SYS;1  NA08Be.SYS;1  NA10Be.SYS;1
   ```

2. Choose the load file NA08Ae.SYS.
3. The letter e at the end of the file name indicates the current software revision of the kit. Record the load file name without the version number (for example, NA08Ax.SYS) in your worksheet. The revision letter changes with each new release. To determine the current version of the kit, check the release notes for revised load file names.
4. Record the load file name in the worksheet.

The load file NA06Ax tests a QNA if two QNA's are present and the one tested is not the load device. The load file NA07Ax tests the Ethernet load device for the service version of MDM because the regular NA06Ax and kits cannot test it. The NA07 file configures only the CPU, MEM, and QNA (or LANCE) load devices; use this file after the NA06 file to test the system thoroughly.

Use the NA09Ax file if the target is loading over SVA lines to a KA640 CPU. The load file NA10Ax must be used if the system loads over SVA-0 lines or a KA640 CPU (Lance) in the customer version of MDM. The NA11Ax and NA12Ax are remote console files; see Appendix A for an explanation on how to use MDM on a remote console.

4.3 Modifying the Host Database for Down-Line Loading

Before beginning the following procedure, refer to the information recorded on the worksheet.

Prepare the host system to down-line load software to the target by completing the following steps:

1. Log into an account that has OPER. To determine account privileges, type the following command:

   ```
   $SHOW PROCESS/PRIVILEGE
   ```

2. Enter the DECnet Network Control Program (NCP) by typing the following command:

   ```
   $RUN SYS$SYSTEM:NCP
   NCP>
   ```

3. Check that the service circuit is enabled for down-line loading software from the host to the target. Obtain the service circuit value from the worksheet and type the following command:

   ```
   NCP> SHOW CIRCUIT service_circuit CHARACTERISTICS
   ```

The following display is typical:

```
Circuit Volatile Characteristics as of 21-MARCH-1989 10:13:30

Circuit = UNA-0
State                   = on
Service                 = enabled
Counter timer           = 28800
Designated router       = 5.170 (GARFLD)
Cost                    = 3
Router priority         = 64
Hello timer             = 15
Type                    = Ethernet
Adjacent node           = 5.170 (GARFLD)
Listen timer            = 45
```

In the display above, the characteristic Service = enabled indicates that the service circuit is ready to down-line load software.

On the other hand, Service = disabled indicates that the service circuit is not ready. Type the following commands to enable the service circuit:

```
NCP>SET CIRCUIT service_circuit STATE OFF
NCP>SET CIRCUIT service_circuit SERVICE ENABLED STATE ON
```

CAUTION: *Setting the service circuit to STATE OFF terminates DECnet mail and file transfers. Set the service circuit to STATE ON to resume normal operation.*

4. Store the target node name and Ethernet hardware address in the host node volatile database by typing the following commands:

```
NCP>SET NODE target_name HOST host_name
NCP>SET NODE target_name SERVICE CIRCUIT service_circuit
NCP>SET NODE target_name HARDWARE ADDRESS hardware_address
```

   Storing the target node name and hardware address in the host Ethernet database allows the target to request a down-line load from the host.

5. Verify that the above commands were entered successfully by typing:

```
NCP>SHOW NODE target_name CHARACTERISTICS
```

The following typical characteristics appear:

```
Circuit Volatile Characteristics as of 21-MARCH-1989 13:31:26

Remote node =   5.524 FRED

Service circuit           = QNA-0
Hardware address          = AA-00-03-01-3C-79
Host                      =  5.900 host_name
```

NOTE: *Additional items may appear in the Node Volatile Characteristics display depending on the host's DECnet configuration.*

The host system is now ready to down-line load software. Proceed to the target console terminal to boot MDM software.

Chapter 5
Down-Line Loading the Kit

This chapter describes the procedure for using DECnet/Ethernet facilities to down-line load MDM software into target computers. Information about operating MDM from the target is in Chapter 6.

5.1 The Down-Line Loading Sequence

The target computer starts the down-line loading procedure by broadcasting a boot request over the Ethernet circuit to all systems on the circuit. The host responds to the target's boot request by down-line loading MDM software automatically into the target memory.

5.2 Establishing Login Proxy for Down-Line Loading

When run on target systems that have login proxies with the host system, MDM may report errors when trying to load the individual diagnostics into memory. The error message is:

```
%x00007d64
```

The error occurs because MDM uses the USER account on the host to copy diagnostics over the Ethernet. To prevent this problem without disabling the proxies or compromising system security, establish a proxy for USER as follows:

```
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
UAF> ADD/PROXY target_name::USER DECNET
UAF> EXIT
$
```

This proxy maps the USER account to DECNET. If the USER account proxy is normally active on the host system, re-establish the account after MDM has run on the target system. To re-establish the account, enter the following commands:

```
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
UAF> ADD/PROXY target_name::USER account_name
UAF> EXIT
$
```

5.3 Stopping Multiple Hosts from Down-Line Loading Software into the Target

If more than one host system has MDM installed, the target may not load the monitor from the expected host. When MDM tries to bring in the diagnostics from the expected host, MDM fails. Enter the following commands to disable service on any other node that has MDM installed on it:

```
$ RUN SYS$SYSTEM:NCP
NCP> SET CIRCUIT service_circuit STATE OFF
NCP> SET CIRCUIT service_circuit SERVICE DISABLED STATE ON
```

After running MDM, restore service.

CAUTION: *If service is disabled on the system, no satellite system can boot from it.*

If more than one down-line loading host is connected to the target, prevent hosts not containing the MDM Ethernet Server Kit from down-line loading their software into the target. To ensure that only MDM software is down-line loaded into the target system, use the following procedure:

1. Log into the operator account on each host *not* containing the MDM Ethernet Server Kit and type the following commands:

   ```
   $ RUN SYS$SYSTEM:NCP
   NCP> SHOW NODE target_name CHARACTERISTICS
   ```

   Issuing the SHOW NODE command results in a display similar to the following:

   ```
   Node Volatile Characteristics as of  8-MAR-1989 11:02:19

   Remote node =   5.524 (GARFLD)

   Service circuit      = UNA-0
   Hardware address     = AA-00-03-01-3C-79
   Load file            = DISK$USER2:[JONES]APPLICATION.SYS;
   ```

2. Record the service circuit value from a Node Volatile Characteristics display for each down-line loading host that does not contain MDM software.

3. Prevent a host not containing MDM from servicing the target's boot request by typing the following command at the host terminal:

```
NCP> CLEAR NODE target_name SERVICE CIRCUIT service_circuit
```

4. After preventing hosts not containing MDM software from servicing the target, start the down-line loading procedure by booting the target system as described in Chapter 6.

5.4 Restoring the Down-Line Loading Connection

After booting and using MDM, restore the down-line loading connections from the unused hosts to the target by using the host service circuit value recorded from the Node Volatile Characteristics display. Type the following commands at the host terminal:

```
$ RUN SYS$SYSTEM:NCP
NCP> SET NODE target_name SERVICE CIRCUIT service_circuit
```

5.5 Down-Line Loading with VAX PSI

In the STARTNET.COM file for DECnet Version 5.0, the logical names required for down-line loading do not set up if the system is also running VAX PSI.

The logical names MOM$SYSTEM, MOM$LOAD, and MOM$SYSTEM_SOFTID are set up by SYS$MANAGER:STARTNET.COM. However, the required DCL command is omitted if the startup file for VAX PSI (STARTPSI.COM) is executed. This omission causes down-line load operations to fail for Terminal Server, Local Area VAXcluster, and other products.

While using PSI, modify SYS$MANAGER:SYSTARTUPV5.COM (or another appropriate startup file) to execute another .COM file to define logicals as follows:

- Define all system logicals except MOM$LOAD, including MDM$MAINT.
- Define /SYSTEM MDM$MAINT disk:[MDMMAINT].
- Define /SYSTEM MOM$LOAD to as many directories as necessary, such as MDM$MAINT and SYS$SYSTEM.

NOTE: *Do not modify the STARTNET.COM file.*

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Chapter 6
Booting MDM at the Target

Booting MDM at the target involves typing the BOOT command at the prompt and providing the name of the MDM load file to be down-line loaded. The following qualifiers are available with the command:

- Halt enabled
- Halt disabled

The following sections describe how to boot with each option.

6.1 Booting MDM at the Target with Halt Enabled

To cause the target to send boot requests to the host, complete the following steps:

1. Put the target system into console I/O mode by moving the Halt Enable switch to the Halts Enabled (dot inside circle) position. The switch is on the CPU panel at the rear of the system. The CPU panel is shown in Figure 3–2.

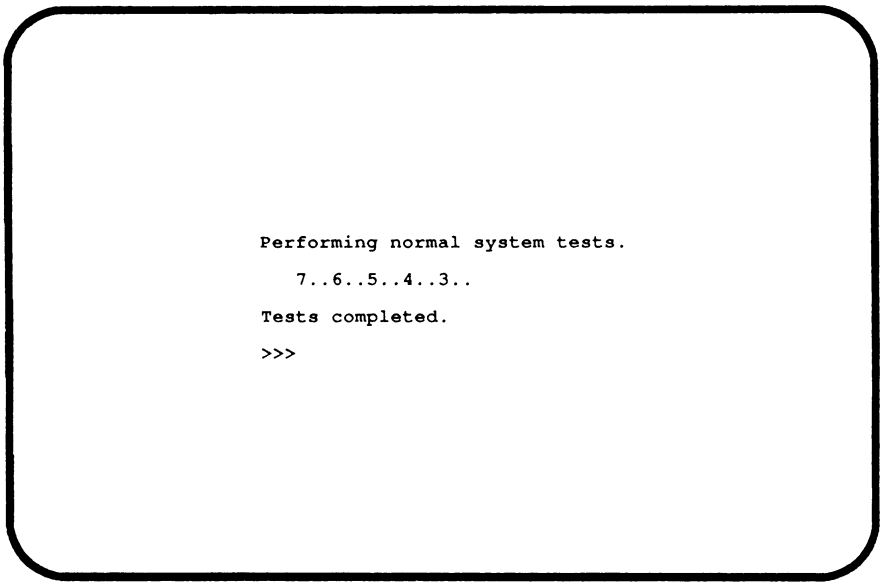
   CAUTION: *Before running in console mode, shut down the target system if it is running any operating system software.*

2. If the power 1/0 switch is set to the 1 position, press BREAK at the console terminal to display the console I/O mode prompt (>>>).

   If the power switch is set to the 0 (off) position, set it to the 1 (on) position.

   The console terminal displays the numbers 7 through 3 to indicate completion of each step in the power-on tests. After the power-on tests are completed, the terminal displays the console I/O prompt (>>>). Figure 6–1 shows the power-on display and console I/O prompt.

Figure 6–1: Power-On Display with Halts Enabled



3. Start boot requests from the target to the host by typing the boot command at the target console terminal as follows:

   ```
   >>> B/100 ESAO
   ```

   The system responds with the numerical progress message:

   ```
   2..
   ```

   This response means that a boot request has been sent to the host.

4. Refer to your worksheet for the name of the load file. Type the name of the load file when the system requests a bootfile:

   ```
   Bootfile:load file_name
   ```

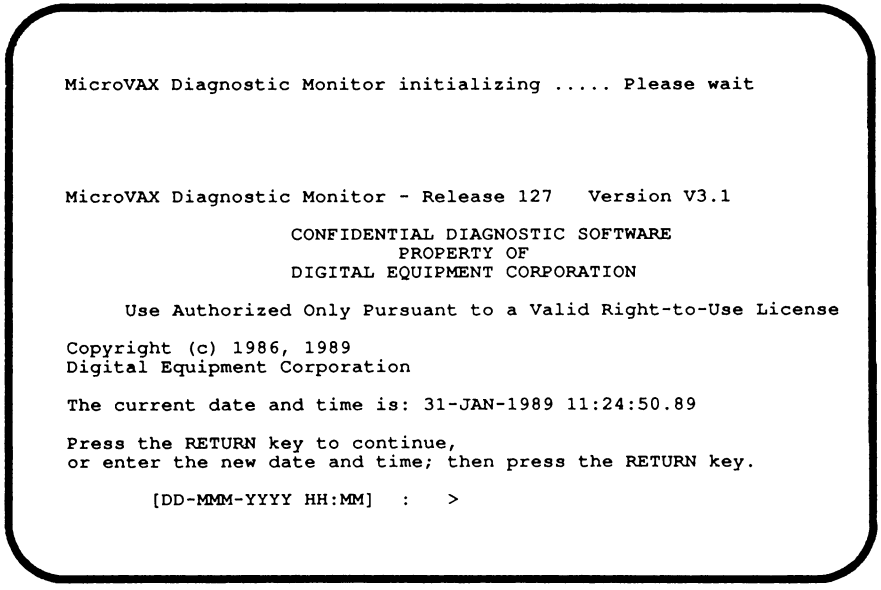
   The system reponds with the following progress messages:

   ```
   1..0..
   ```

The 1.. in the display shows that the load file was down-line loaded into the target memory. The 0.. means that the target has booted without error.

The next display is the introductory display of MDM as shown in Figure 6–2.

Figure 6–2: Introductory Display of the MicroVAX Diagnostic Monitor


MicroVAX Diagnostic Monitor initializing ..... Please wait
MicroVAX Diagnostic Monitor - Release 127 Version V3.1
CONFIDENTIAL DIAGNOSTIC SOFTWARE
PROPERTY OF
DIGITAL EQUIPMENT CORPORATION
Use Authorized Only Pursuant to a Valid Right-to-Use License
Copyright (c) 1986, 1989
Digital Equipment Corporation
The current date and time is: 31-JAN-1989 11:24:50.89
Press the RETURN key to continue,
or enter the new date and time; then press the RETURN key.
[DD-MMM-YYYY HH:MM] : >
MLO-002366

6.2 Booting MDM at the Target with Halt Disabled

Booting MDM at the target with halt disabled avoids having to access the Halt Enable switch on the CPU panel behind the system backpanel cover. However, rebooting MDM with halt disabled requires more time than does rebooting with halt enabled.

To boot MDM with halt disabled, complete the following steps:

1. To prevent a timeout of the network boot, place off line all disk and TK50/70 tape drives. Once MDM comes up, place the drives on line before configuring the system to test them.
2. Specify the load file parameter in the NCP database; otherwise, the host does not know what file is needed by the target. Enter the following command:

   ```
   NCP> SET NODE target_name LOAD FILE MDM$MAINT:NA0nAx
   ```

   where n = 6, 7, 8, 9, 10, 11, or 12.
3. Power on the system by setting the system power 1/0 switch to the 1 position. Boot requests are automatically sent to the host.
4. See Figure 6–2 for the introductory display of the MicroVAX Diagnostic Monitor. Check that the current date and time in the introductory display are accurate; if so, press RETURN to continue. If the current date and time are inaccurate, type the correct date and time in the format shown; then press RETURN to continue.

   Several minutes elapse before the ready-for-testing display appears on the console terminal.
5. Press RETURN to obtain the Main Menu.

6.3 Operating MDM

MDM is a menu-driven maintenance and diagnostic software package that uses the MDM operating system. For information about using the service version of MDM, refer to the *MicroVAX Diagnostic Monitor User's Guide*. For the customer version of MDM, refer to the *MicroVAX Customer Hardware Information Manual*.

Appendix A
Remote Console

This appendix describes how to use the remote console feature of MDM. The remote console feature allows the user to run MDM from the host system rather than from the console terminal on the target. Running remote console requires no special privileges. Complete the following steps to use remote console:

1. Once MDM is installed, set up the network database as explained in Chapters 3 and 4. Ensure that the special cases shown in Chapter 5 do not apply.
2. Boot the NA11Ax or NA12Ax image at the target. Use NA11Ax if the target has a DEQNA, DELQA, or DESQA as its Ethernet controller. Use NA12Ax if the target has a KA640 CPU and loads over the LANCE port located on the CPU front panel. The boot process is as follows:

   ```
   >>> BOOT/100 xqa0
   2...
   Bootfile: NA11Ax.sys
   ```

   For LANCE load devices, type the following command:

   ```
   >>> BOOT/100 esa0
   2...
   Bootfile: NA12Ax.sys
   ```

3. Wait until the uVDOS banner appears on the target's screen.
4. Log into an account on the host system; set the default directory to MDM$MAINT.
5. Once the uVDOS banner appears on the target console, type the following command from the host:

   ```
   $ RUN FE$REMOTE
   ```

6. Enter the target node name and any five-character password when prompted.

After the MDM introductory display appears, run MDM the same in remote console mode as from the target console with the exception of using CTRL/C.

Entering CTRL/C aborts the MDM process and returns to VMS. To stop the process, enter the following command:

```
$ STOP username_1
```

Username refers to the username at login. For example, if running remote console from the system account, enter the following command to stop MDM:

```
$ STOP system_1
```

If the target does not have a console, follow the steps in Section 6.1. When the CPU LED's read 0, MDM will be loaded into the target.

To exit remote console, use one of the following methods:

- Press CTRL/C and log out.
- Press CTRL/C and enter the following command to stop the MDM process:

  ```
  $ STOP username_1
  ```

Appendix B
Installing MDM Ethernet Ultrix Kit

This appendix describes how to install the MDM Ethernet Server Ultrix Kit on the Ultrix host system. The Ultrix operating system distinguishes between uppercase and lowercase letters; type user input exactly as shown.

B.1 Installing the Kit

Installation of the kit installs the MDM system images into a subdirectory of the field account MDMMAINT. To install the kit on the host system, complete the following steps:

1. Log into the field service account.

```
login: field
password: password
$
```

2. Load either the TK50 tape or the 1600 bpi magtape into the tape drive.

3. Issue the followingcommand at the prompt:

```
$ dd if=/dev/nrmt[*] of=cpcufiles
```

   Where [*] is the tape drive number, for example, 0h or 1h. This commmand displays the following message:

```
1+1 records in
2+0 records out
```

4. When the prompt returns, type the following command to set protection of the file cpcufiles to full privilege:

```
$ chmod 777 cpcufiles
```

5. To copy the system files off the tape into the MDMMAINT directory, execute the file cpcufiles by typing the following command:

```
$ cpcufiles
```

The CPCUFILES command copies the files NAU04A.SYS, NAU05A.SYS, and NAU06A.SYS to a directory called /usr/field/mdmmaint. The directory MDMMAINT is created by CPCUFILES.

You will see messages similar to the following:

```
1243+0 records in
1243+0 records out
1238+0 records in
1238+0 records out
1346+0 records in
1346+0 records out
```

At the prompt, type the following commands to check that the files reside in the MDMMAINT directory:

```
$ cd mdmmaint
$ ls -l
```

This command lists the file names and their protection.

B.2 Preparing to Down-Line Load

The system software is now in place on the target in a subdirectory of the field service account mdmmaint. To down-line load a system, complete the following steps:

1. Type the following commands to add the target node to the node's database:

   a. Type the following command to move the directory to the add-node program:

      ```
      $ cd /etc
      ```

      The system displays the following information:

      ```
      $ addnode MYNODE -h 08-00-2b-02-18-4c\
      -c qna-0\
      -l /usr/field/mdmmaint/nau04a.sys
      ```

      Table B–1 provides descriptions of the display's information.

Table B–1: Information from Addnode Command

Item	Definition
MYNODE	the name of the target node
-h [1]	the target node's hardware address
-c [2]	the service circuit
-l [3]	the load file that must have a .sys extension
nau04a.sys	the diagnostic system image

[1]In this example, h is 08–00–2b–18–4c.

[2]In this example, c is qna–0.

[3]In this example, l is /usr/field/mdmmaint/nau04a.sys.

To test the different consoles, change the load file by entering the ADDNODE and –l commands as follows:

```
$ addnode mynode -l loadfile.sys
```

Loadfile.sys is the loadable diagnostic system image name and the complete file location description. The three system images provided are capable of diagnosing the listed devices.

```
Customer Kit images
nau04a.sys -  vsv21 console, cpu, mem, rqdx, tk50, qna
nau05a.sys -  vcb01 console  cpu, mem, rqdx, tk50, qna
nau06a.sys -  vcb02 console  cpu, mem, rqdx, tk50, qna

Maintenance Kit images
nau01a.sys -  vsv21 console, cpu, mem, rqdx, tk50, qna
nau02a.sys -  vcb01 console  cpu, mem, rqdx, tk50, qna
nau03a.sys -  vcb02 console  cpu, mem, rqdx, tk50, qna
```

b.

- To check that the node was added successfully, type the following command:

  ```
  $ getnode mynode
  ```

- To check that the node was added, type the following commands:

  ```
  $ ncp
  ncp> show node mynode char
  ```

2. Type the following command to boot the system from the target node:

   ```
   >>> b xqa0
   ```

B.3 Deinstalling the Kit

The Ultrix Customer Kit is a licensed product that cannot be left on the customer's host system. After diagnosing the system, deinstall the kit. To delete the MDM system files and the directory they reside in, complete the following steps:

1. Type the following command to move to the system images:

   ```
   $ cd /usr/field/mdmmaint
   ```

2. To delete the files, type the following command:

   ```
   $ rm *.*
   ```

3. To move to the /usr/field, type the following command:

   ```
   $ cd ..
   ```

4. Enter the following command to delete the mdmmaint directory:

   ```
   $ rmdir mdmmaint
   ```

5. Enter the following command to delete the copyfile program:

   ```
   $ rm cpcufiles
   ```

6. Log out of the system:

   ```
   $ logout
   ```

Glossary

back up
The process of copying data stored in a disk drive(s) so that you can recover that data after an accidental loss.

backplane
The connector block that all computer printed-circuit boards plug into. A printed-circuit board containing the bus.

boot
To run a program that loads software into memory. Turning on a computer boots the operating system software that allows it to start processing data.

bootfile
An operating system file loaded into memory when a computer is started. See *load file*.

bus
The bus permits communication among the other devices in the computer. It usually consist of the backplane(s) and backplane jumpers.

central processor
See *CPU*.

CI
The abbreviation for Computer Interconnect.

circuit
Virtual communication path between nodes. Circuits operate over physical lines and are the medium on which all I/O occurs.

console I/O mode
Console I/O (input/output) mode allows you to control the computer using a console command language at the console I/O prompt, >>>.

controller
A device that manages communications over a line.

CPU
The abbreviation for central processing unit. The CPU is the main unit of a computer that interprets and executes instructions. The CPU is also known as the central processor.

DECnet
Digital Equipment Corporation's networking software.

DECnet database
A central collection of information defining a network's components and parameters.

deinstallation procedure
The process of eliminating all the software that was stored on a computer as the result of a software installation procedure.

device
The general name for any piece of equipment connected to a computer that is capable of receiving, storing, or retrieving data.

diagnostic program
A program that detects and identifies abnormal hardware operation.

distribution device
The computer device from which software is installed on the system.

distribution media
The disks or magnetic tapes on which software is distributed for installation.

distribution volume
A mass storage medium, such as a disk or a reel of magnetic tape, used to distribute software.

down-line load
To transfer copies of software from a host node to a target node.

DSSI
The abbreviation for Digital Small Storage Interface; DSSI is a mass storage protocol.

Ethernet
A local area network component that provides a high-speed communications channel linking computers located in a limited geographic area, such as an office or a building.

Ethernet address
A string of six pairs of hexadecimal numbers separated by hyphens (for example, AA–01–23–45–67–FF) that uniquely identifies a node connected by the Ethernet to a network. A computer's Ethernet address is contained in read-only memory (ROM) on the computer's interface module. The Ethernet address is also known as the Ethernet physical address or the Ethernet hardware address.

Ethernet circuit
A type of DECnet circuit that provides a multiaccess communication path between a number of nodes on the same broadcast circuit. Each node on a single Ethernet circuit is considered to be adjacent to every other node on the circuit and equally accessible.

Ethernet hardware address
See *Ethernet address*.

Ethernet physical address
See *Ethernet address*.

event logging
The recording of occurrences taking place during network operation by the network software. A partial list of events includes: changes in circuits, lines, and node states; and service requests, such as the request for a down-line load of software.

executor node
A host node that performs down-line load operations on the network.

free blocks
Unused units of storage space in a storage device.

Halt Enable switch
A switch located on the rear panel of a MicroVAX II. When the switch is set to the Enable position, the system enters console I/O mode. See *console I/O mode.*

hardware address
See *Ethernet address*.

host
The primary or controlling computer in a multiple computer network.

host node
A computer that provides services to another computer (target node) over network communication channels.

image file
An executable file containing the software that is read into memory when a computer is started up.

installation procedure
The process of converting the software from a transportable distribution medium, such as a magnetic tape or disk, to a form that can be booted and run on a computer's CPU.

I/O
The state of a file after execution of an OPEN statement, with the input-output phrase specified for that file, and before the execution of a close statement for that file.

LAVc
The abbreviation for Local Area VAXcluster. LAVc is a privately owned configuration of VAX systems that share mass storage.

line
The network management component that provides a distinct physical data path.

load file
A file to be down-line loaded to the target node. The load file consists of an operating system image file or diagnostic programs.

load request
The message sent by the target node to the host node requesting that the host down-line load software over the network to the target.

local area network (LAN)
A data communication system that operates over a limited physical distance. An Ethernet network is a local area network.

logical name
A logical name is a name that stands for a string of characters. The VMS Digital Command Language (DCL) allows you to create logical

names. For example, you could define the logical name, diary, and make diary represent the following disk, directory, and file names: USE1:[MALCOLM.PERSONAL]DIARY.TXT.

log in
To gain access to an operating system as an authorized user.

Maint.sys
The area of the disk reserved for maintenance use only.

NCP
The Network Control Program (NCP) is a VMS utility program that configures, controls, monitors, and tests the DECnet network.

network
Two or more computers connected by a shared communication path.

network area
A grouping of nodes in a network. In a multiple-area network, each separate area functions as a subnetwork.

NI
The abbreviation for Network Interconnect; NI is Digital's name for the Ethernet.

node
A computer connected to a data network. More specifically, a node is an operating system that uses DECnet software to communicate with other operating systems across a network.

node address
One of the two forms of node identification. The node address is a numerical address that uniquely identifies a network node. An example is 5.524. The integer before the decimal point identifies the network area, and the number after the decimal point is the node number. See *node name*.

node name
One of the two forms of node identification. The node name is an alphanumeric string. Some examples are FRED and Y17. See *node address*.

operating system
A collection of programs that control the overall operation of a computer system and perform such tasks as:

- Assigning places in memory to programs and data
- Processing requests and scheduling jobs
- Controlling the operation of input and output devices

operator privileges (OPER)
The OPER privilege enables you to write information to all permanent database files and to modify volatile database files.

privilege
A privilege allows users to access files and directories that may be protected from access by other users. The privilege is protected by password security.

progress message
A message generated by the currently running software telling the progress of its activity, such as whether or not it is continuing successfully.

proxy login
The procedure that permits a remote user to access a specific account at the local node, without supplying the user name and password.

service circuit
A connection between the host and target computers through which software is down-line loaded.

SETPRIV
Allows the user to have all system privileges.

software installation
Activities performed to prepare a copy or copies of software so that the system can be used.

SYSPRIV
This privilege allows you to access system protected files like the network configuration files.

system
A group of related elements that are interactive to form a complete whole that performs a specific function.

system disk
The disk that contains a computer's operating system software.

target disk
The disk on a computer that receives the software from an installation procedure.

target node
A computer that receives software programs and services from another computer (host node) over network communication lines. For example, the target node receives the bootstrap loader and the system image file.

terminal
The general name for peripheral devices that have keyboards and video screens or printers. Under program control, a terminal enables users to type commands and data on the keyboard and receive messages on the video screen or printer.

terminal server
A system part that connects terminals to services on nodes in a local area network; users have the same capability that they would have if they were connected to the node by direct lines.

UAF utility
A program that allows you to access the user authorization file.

user authorization file
A file that lists all users who can access the system and defines the characteristics for each user's process (account). The system manager usually maintains this file.

VAXcluster
An organization of VAX computers that communicate over a high-speed communications path and share central processor resources as well as disk storage.

volatile database
A memory-resident database containing current network configuration parameters.

volatile memory
A type of computer memory whose contents are erased when the computer's power is turned off.

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